SF Bay Nutrient Numeric Endpoint (NNE) Project

San Francisco Bay Stakeholder Advisory Group

May 20, 2011 Meeting Summary

Note: Additional materials from the meeting (PowerPoint presentations) are available on the project website:

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/amendments/estuarynne.shtml

Another note: The summary captures the major issues presented and discussed during the meeting, though they are not intended as an exhaustive record of all comments made. Where it contributes to the readability of the summary, discussion of the same issue that occurred at more than one place during the meeting is summarized together. Items on which the Committee expressed general agreement are indicated **in bold**, although it is important to emphasize that the Committee did not vote on these items. Specific commitments by State Board staff, SCCWRP, the facilitator, or Committee members are also indicated **in bold**.

Meeting objectives

The main goals of the meeting were to:

1. Agree on criteria for selecting Science Advisory Panel (SAP) members
2. Review the recommendations of the Technical Advisory Team on the literature review of candidate indicators
3. Discuss and provide feedback on the literature review
4. Discuss and provide input on workplan development

Background context

(References to slides are to the presentation posted on the project website: May 20, 2011 SAG Meeting Presentation)

Martha Sutula reviewed the project's overall scope and process (slide 2) and identified the interim goal of developing a workplan for the San Francisco Bay portion of the NNE (slides 3 – 6). The indicator literature review and data gap analysis is an important building block for development of the workplan.

Science Advisory Panel

(slides 12 – 16)

Candidate SAP members are grouped into categories related to different areas of technical expertise. Much of the available local expertise is already involved in the project as part of the technical team and there are potential conflicts of interest in using local scientists because some of them may be involved in implementing the workplan. For these and other reasons, the project is following the practice designed by the State Water Board for such panels by recruiting SAP members primarily from outside California. There is a sweet spot in terms of the size of the panel. Too large a panel makes it difficult to schedule meetings; too small a panel does not include the required expertise. The proposed candidates have a

suitable breadth of expertise and additional experts can be brought in to help address specific issues as needed.

Discussion highlighted the importance of including experience with implementation and concerns about the large number of potential issues included under the "ecosystem" category. **The workgroup agreed on the criteria for selection of SAP members (slide 13) with the caveat that the aquatic ecosystem category may need to be expanded**. Some additional names were suggested and **Martha asked the workgroup to provide any additional comments, concerns, or suggestions within two weeks**.

Literature review and data gaps
(slides 18 – 74)

Martha reviewed (slides 18 – 28) the conceptual framework for developing indicators for key habitats and the criteria for evaluating indicators.

Candidate indicators

The workgroup then walked through each category of indicators to identify questions and concerns, answer the review questions in slide 19, and assess the degree of agreement with the information and judgments in the literature review.

Table 6.1 indicators: Slides 29 – 31

The Water Boards have not yet defined the complete regulatory framework for the Coastal and SF Bay NNE. The program's approach is to first select indicators and then move to defining the assessment framework and the policy implementation. While this may make it somewhat difficult to evaluate the indicators, stakeholders should assume that indicators would be evaluated in the context of listing once impairment thresholds are defined. Listing would still need to be conducted in accordance with the State's Listing Policy.

- DO
  - Stakeholders agreed with conclusions of literature review
- Phytoplankton
  - Biomass without taxonomy is not completely useful, but biomass is easy to measure and understanding may not be developed enough to set thresholds based on taxonomic composition; while information about taxonomic composition is valuable, we don't have confidence in our ability to model the linkage between taxonomy and nutrient loads
  - While it is probably not possible to include complete taxonomy in the indicators, the percent diatoms is ecologically important and the science team thinks that biomass should not be used alone but included in a multiple lines of evidence (MLOE) approach (which is the approach adopted by the freshwater NNE)
    - If the stakeholders and the science team agree that diatoms are important, then this would help direct the science; it is difficult at present to model the linkage between percent diatoms and nutrient loads
    - A MLOE approach raises the question of whether lines of evidence can be applied independently, for example, if one indicator is extremely high (or low)
    - How an MLOE approach would work has not yet been defined, but Martha agreed that the assessment framework should be more than simply a list of primary and supporting indicators
  - The time of year and location where biomass is measured is important
  - Productivity is a rate and can be measured either directly or indirectly; it does not meet all the criteria for a primary indicator and should be a supporting indicator
- Harmful algal blooms

- o Cyanobacteria may be washing into the Bay from the Delta and some suggested that the focus should therefore be on the Delta; however, cyanobacteria could be having impacts on mammals/fish in the Bay. This is something that needs better evaluation.
  - o It will be important to improve understanding of cyanobacteria to determine if it should be a primary or supporting indicator
- Ammonium and urea
  - o Stakeholders agreed with conclusion of literature review
  - o Nitrate was considered and may be part of the mix of supporting indicators but it is not yet clear how nitrate would be used in the assessment
  - o The N/P ratio was not included because it does not control composition and it is hard to envision how changes in the ratio could affect composition; the intent now is to focus more directly on biology as indicators; however, N/P could be a supporting cofactor if knowledge improves; it will be up to the scientists to make that determination.
- Light attenuation
  - o Stakeholders agreed with conclusions of literature review
  - o Useful cofactor primarily for seagrass
- Macroalgae
  - o Stakeholders agreed with conclusions of literature review
- Epiphyte load
  - o Stakeholders agreed with conclusions of literature review
- Macrobenthos
  - o Stakeholders agreed with conclusions of literature review

Primary vs. supporting indicators: Slides 32 – 36
Habitats are split out separately even though many share the same indicators because thresholds could differ across habitats.

- Phytoplankton productivity
  - o Suggestion to move to supporting indicator
- Cyanobacteria
  - o Suggestion to remove as primary indicator
  - o The science team will consider this
- Grazing
  - o Missing zooplankton grazing; should be taken into account somehow
  - o The science team could not come up with a way to include this, although they acknowledge its importance and also recognize that other indicators integrate grazing pressure. It will be included as a cofactor
- Seagrass habitat
  - o Suggestion to remove phytoplankton productivity
  - o It is not clear how epiphyte load could be used in the assessment
  - o Seagrass habitat is a lower priority in terms of nutrient impacts; the relative amount of emphasis it receives will depend on decisions about the habitat's importance statewide
  - o Suggestion to add light attenuation as a supporting indicator for all subtidal habitat, not just seagrass
- Intertidal mudflats
  - o Suggestion to add salinity as a cofactor

Table 6.3 Data available re eutrophication: Slides 38 – 48
Discussion did not proceed systematically through the habitats and indicators in Table 6.3. Comments included:

- Suggestions to review phytoplankton data collected by DWR and IEP
- The importance of phytoplankton speciation in understanding eutrophication
- A reminder that the science team's work did not include original analysis, only literature review focused on selecting indicators
- A reminder that attention to factors that might change the response curve to nutrients, e.g., changes in flow, will come later, after indicators are selected
- A request to submit written comments on data availability

Sources and pathways: Slides 49 – 53
Discussion did not proceed systematically through the material in the slides. Comments included:

- Some sources and pathways are likely to change significantly over the next ten years
- Some sources such as sediment recycling and benthic flux are not included in the report
- There was general agreement on the need to include estimation of nutrient budgets in the workplan, broken down by bay segments; this could be accomplished using existing data
- USGS has just published a summary of nutrient loads that should be useful
- New data on nutrients in stormwater will soon be available that will help provide order of magnitude estimates of inputs to different segments of the bay and will also help separate urban inputs from other sources
- Suggestion to initially represent all nutrient loads at Total N in the indicator report; while tempting, this is something that is better addressed in the workplan where it can be done more carefully and thoroughly
- Suggestion to compile additional DO data and to review the DO objective in muted areas and tributaries
- Estimating nutrient exchange with the coastal ocean is a low priority; this is very difficult to quantify; future efforts could couple a bay model to the ROMS model. However, exchange with the coastal ocean could be an important factor and we can't assume that all nutrients in the bay are due to nearfield anthropogenic effects

Models: Slides 63 – 70
There was general agreement on the modeling recommendations. Comments included:

- Inventory models and results for other bay modeling efforts to date
- Coordinate modeling approach, amount of data required, cost, and schedule, and what policy decisions will be informed
- It will be important to define the acceptable level of precision in modeling efforts
- Look at the other existing models for Suisun Bay, which might provide a starting point for scoping the bay effort

Future meetings

The next meeting of the San Francisco Bay SAG is now scheduled for March 29, 2012.